

Application No. 10/022,864  
Response to Final Office Action

Customer No. 01933

Listing of Claims:

Claims 1 and 2 (Canceled).

3. (Currently Amended) A 3D image acquisition apparatus  
according to claim 2, comprising:

a pattern projection section which projects a predetermined  
pattern on an object;

5 an imaging section which is positioned at a predetermined  
distance from said pattern projection section and which images  
the object having the predetermined pattern projected thereon;  
and

10 a depth calculation section which detects an image pattern  
based on an image acquired by said imaging section, collates the  
detected image pattern and the predetermined pattern, and  
calculates a depth of respective parts of the object based on the  
collation;

15 wherein the predetermined pattern includes patterns of a  
plurality of color components, and the pattern of each of the  
plurality of color components includes local maximum areas with  
local maximum luminance values and local minimum areas with local  
minimum luminance values, wherein in the pattern of each of the  
plurality of color components a total number of the local maximum  
20 luminance values and the local minimum luminance values is at

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25 least three, and wherein the local maximum areas are arranged  
alternately with the local minimum areas to encode the pattern of  
each of the plurality of color components based on the  
arrangement of the local maximum areas and the local minimum  
areas and the luminance values corresponding to the respective  
local maximum areas and the respective local minimum areas; and  
wherein in the patterns of each of the plurality of color  
components, positions of the local maximum areas and positions of  
the local minimum areas are the same.

Claim 4 (Canceled).

5. (Currently Amended) A 3D image acquisition apparatus  
~~according to claim 2, comprising:~~

a pattern projection section which projects a predetermined  
pattern on an object;

5 an imaging section which is positioned at a predetermined  
distance from said pattern projection section and which images  
the object having the predetermined pattern projected thereon;  
and

10 a depth calculation section which detects an image pattern  
based on an image acquired by said imaging section, collates the  
detected image pattern and the predetermined pattern, and

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calculates a depth of respective parts of the object based on the collation;

15     wherein the predetermined pattern includes patterns of a plurality of color components, and the pattern of each of the plurality of color components includes local maximum areas with local maximum luminance values and local minimum areas with local minimum luminance values, wherein in the pattern of each of the plurality of color components a total number of the local maximum  
20     luminance values and the local minimum luminance values is at least three, and wherein the local maximum areas are arranged alternately with the local minimum areas to encode the pattern of each of the plurality of color components based on the arrangement of the local maximum areas and the local minimum  
25     areas and the luminance values corresponding to the respective local maximum areas and the respective local minimum areas; and

wherein positions of the local maximum areas in the pattern of at least one of the plurality of color components are the same as positions of the local minimum areas in the patterns of the  
30     others of the plurality of color components.

6. (Currently Amended) A 3D image acquisition apparatus according to claim 2 5, wherein said plurality of color components are RGB components.

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Claims 7-11 (Canceled).

12. (Currently Amended) A method for encoding a spatial pattern for 3D image acquisition, said method comprising:

generating a spatial encoding pattern including local maximum areas with local maximum luminance values and local minimum areas with local minimum luminance values, wherein a total number of the local maximum luminance values and the local minimum luminance values is at least three; and

alternately arranging the local maximum areas with the local minimum areas to encode the predetermined pattern based on the arrangement of the local maximum areas and the local minimum areas and the luminance values corresponding to the respective local maximum areas and the respective local minimum areas;

wherein the spatial encoding pattern is encoded in substantially independent wavelength bands; and

wherein the wavelength bands are R, G and B and the local maximum areas and the local minimum areas of each of R, G and B are aligned.

13. (Previously Presented) A method according to claim 12, wherein the spatial encoding pattern is one of a stripe pattern and a matrix pattern.

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Claims 14-16 (Canceled).

17. (Previously Presented) A 3D image acquisition apparatus according to claim 3, wherein said plurality of color components are RGB components.

Claim 18 (Canceled).

19. (Currently Amended) A 3D image acquisition apparatus according to claim ~~2~~ 5, wherein the predetermined pattern is one of a stripe pattern and a matrix pattern.

20. (Previously Presented) A 3D image acquisition apparatus according to claim 3, wherein the predetermined pattern is one of a stripe pattern and a matrix pattern.

Claim 21 (Canceled).